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Gender inequality and disabled inclusivity in accounting higher education and profession during financial crisis

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Abstract

In this paper, we find that during financial crises, the wage gap between female and male accounting professionals reduces and affects gender inequality in higher education. In addition, less support and lower wages for disabled accounting professionals demotivate disabled students in accounting higher education. Because of budget cuts during financial crisis, universities limit their support to women and the disabled. We consider 104 universities from the UK Higher Education Statistic Agency (HESA) database for 2005–2011. The theoretical and empirical findings of this paper establish the positive growth in female students and the negative growth in disabled accounting students during the recent financial crisis. The established link between higher education and the accounting profession enriches the existing accounting literature and assists policymakers in identifying a better strategy to enhance equality and inclusion of disabled students in accounting higher education to address inequality and non-inclusivity in the accounting profession, especially during financial crisis.

Keywords: Female and disabled accounting students; UK higher education; Accounting profession; Financial crisis

1. Introduction

Gender has a structuring effect on society (Dambrin and Lambert, 2012; Flynn et al., 2015) that has led to extensive empirical and theoretical works on this issue during the last few decades¹. It is also a substantive issue in accounting and remains a concern for the accounting academic community (Broadbent and Kirkham, 2008). Most of the existing studies provide various theories and methodologies to explain gender inequality in accounting profession (e.g., Loft, 1992; Kirkham and Loft, 1993; Lupu, 2012; Adapa et al. 2016). These studies use either a pseudo-neutral perspective (criteria inherent to women) (Loft, 1992) or a comprehensive perspective (impact of external factors) (Kirkham and Loft, 1993) to explain gender inequality in the accounting profession (Lupu, 2012). However, these findings are inconclusive (Dambrin and Lambert, 2012). Moreover, other studies on accounting highlight factors affecting the differences in the academic performance of women and men at different levels of education, including accounting programs (see Keys, 1985; Carpenter et al., 1993; Jacobs, 1996; Fogarty, 1997; Gammie et al. 2003; Keller et al. 2007; Kornberger et al. 2010). Interestingly, Strier (2010) shows that women succeed more than men in their job performance if they develop specific academic abilities. However, better academic performance by female students is not rewarded with better job wages compared to men (Walby, 2011), and there still exists gender inequality in accounting practice. Therefore, is there any link between gender inequality in accounting higher education and in the accounting profession?

Duff and Ferguson (2007; 2011) and Duff et al. (2007) document the rarity of disabled persons in the accounting profession. Almost all universities encourage disabled

¹ For a critical review in accounting research on gender see Haynes (2017).

students to pursue higher education. However, for obvious reasons, a lower number of disabled accounting professionals indicate that there are fewer disabled accounting students in higher education. Literature in a similar area also shows that disabled accounting professionals get disparate treatment compared to accounting professionals without disabilities (Duff and Ferguson, 2011). Are students with disabilities less attracted to accounting higher education because of exclusivity in the profession?

What do we mean by the term ‘inequality’? Accounting has always been referred to as a masculine professional field (Keys, 1985; Maupin, 1990), and so it is possible that male students dominate accounting programs at the university level education in the UK (henceforth higher education). This motivates us to test the ‘gendering’ of accounting higher education by comparing the number of female and male students in accounting programs at the university level. The financial crisis of 2008 destabilized all sectors in the economy. Thus, the question arises, was accounting higher education in the UK affected by the global financial crisis? We consider the differential wage rates in accounting profession to explain the inequality for female compared to male accounting professionals during the recent global financial crisis. During the financial crisis, salary increases reduced and minimum national wages substantially decreased (Ball et al. 2011). Wage rates for accounting professionals are largely affected by the ethics of this profession (Ravenscroft and Williams, 2004). Recently, Seguino (2010) and Stavropoulou and Jones (2013), among others, showed that during the global financial crisis, the ethical behavior of accounting professionals was questioned by critics and ex ante wage rates de-trended. Moreover, because of the financial crisis, a small change in wages may lead to large-scale changes in taxable income (Saez et al., 2012). As a result,

the educational level of these professionals affects the ethical decision-making process, which reduces wage rates during the financial crisis (Keller et al., 2007). Studies on gender indicate that companies and academia employ women, as their wage rates are lower than those of men for the same work, because this discriminatory strategy lowers labor costs and increases profits for the organization (Kim, 2004; Haynes, 2008; OECD, 2012). Ability of corporations and academia to pay lower wages to women for the same work as men worldwide explains women's entry and increased hiring in certain industries and professions (Whittington, 2011). This is a common practice in the accounting profession and has been well documented in the accounting literature (e.g., Kornberger et al., 2010). The accounting profession has never received 'feminized' status because of the existence of this wage gap, but the financial crisis reduced the wages for both women and men accounting professionals. Therefore, is it possible that this economic change affects the 'masculine' tag attached to the accounting profession and, in turn, the number of male and female students in accounting higher education? It can be argued that reduced minimum national wage rates lead to a greater hiring of people with good academic degrees in this profession, making possible a larger student population seeking accounting degrees. Based on this wage gap, we proxy the gender inequality by the difference in the number of men and women in accounting higher education. According to a recent study by Walby (2011), the economy depends on human and social capital. So, if human or social capital is biased by gender, then there is a high chance that the 'gendered' nature of the workplace would also change. From the above argument, we see a clear indication that gender inequality in higher education has a link with gender inequality in the accounting profession.

Similarly, because of lower physical mobility or flexibility and the requirement of extra support systems, disabled accounting professionals' wage rates are significantly lower than those of accounting professionals without any disability. In addition, during the financial crisis, as mentioned above, organizations were constrained with a lack of surplus funds to support disabled employees with extra provisions (Duff and Ferguson, 2011). Thus, the poor wage rate and less convenient working environment affect the number of disabled accounting professionals in the corporate world. This also affects the interest of disabled students in seeking a degree or certificate in accounting higher education.

In summary, participation in higher education is closely associated with changes in the economy (Crossick, 2010), and professionalization is mostly driven by economic motives (Willmott, 1986; West, 1996). Therefore, we consider the recent financial crisis in our study, which caused massive changes in the economy. In particular, we aim to understand how universities cope with the recent financial crisis and maintain or extend various provisions for female and disabled students in higher education institutes to meet the changing trend of participation of female and disabled accounting students.

The impact of the financial crisis is also noticeable in the higher education sector (Education International Report, 2009; European University Association Report, Jan 2011). Policy makers at the institutional and national levels are concerned about the impact of the financial crisis and are taking necessary steps to overcome the associated problems. The UK is no exception. Following the government's Comprehensive Spending Review (2010), until 2014–2015, there has been a total cut of up to 40% in the budget for higher education in the UK. Universities' annual funding was reduced by

£398M during the time of the crisis (BBC News, October 2013). The data from the Higher Education Statistics Agency (HESA, 2013) indicate that many people pursue higher education even when there is a wage gap or ‘job-cut’ in other industries. The Universities and Colleges Admissions Service’s (2010–2014) data reveal that approximately one-third of UK first-degree entrants are mature students. This supports our argument that people are joining universities at a later age during the global financial crisis. Moreover, many students apply for part-time programs so that they can work and continue their study simultaneously (Study and Work data, HESA, 2013; Universities UK² and HESA report, 2013). The universities that belong to Russell group, usually obtain more public funding for research (Russell International Excellence Group, Spending Review Report 2013). This higher level of funding compared with other universities allows them to introduce advanced research-based practical and professional teaching that not only attracts more students but also allows them to generate more income, which they can apply towards better provisions for female and disabled students (The Guardian, 25 October, 2012). Therefore, in our empirical study, we investigated our research question using this group of universities, along with other universities in the UK, to gain a better understanding of the impact of the financial crisis.

Interestingly, there is a notion that changes in the number of women in a particular profession would change the direction of the profession (Hammond and Oakes, 1992). Moreover, the ethical values of any profession are associated with the ‘gendering’ of the

² Universities UK, founded in 1918, are a representative organization for the UK’s universities. It provides high-quality leadership and support to its members to promote a successful and diverse higher education sector. For details: www.universitiesuk.ac.uk.

profession³ (Keller et al., 2007). Thus, without considering gender, it is hard to get a complete understanding of the development of accounting practices and ideologies (Kirkham, 1992; 1997). Exclusion of educated disabled persons from one profession is not at all acceptable in the 21st century. Thus, based on the above arguments, it is clear that gender inequality and inclusivity of disabled students are critical aspects of the accounting profession. There is a clear gap in the literature, as there is no study where we can find how gender inequality and fewer disabled students in accounting higher education leads to inequality and non-inclusivity in the accounting professional world. Thus, we bridge this gap in the literature by empirically analyzing and answering the following question: What is the impact of the recent financial crisis on gender inequality and disabled students' non-inclusivity in accounting higher education?

The sample consists of all universities in the UK that are reported by the HESA (Higher Education Statistics Agency) in the Higher Education Information Database for Institutions (HEIDI) database. Our sample period covers the years 2005–2011. We find that there is a positive growth of female accounting students and a negative growth of disabled accounting students during the financial crisis. Based on the tokenism concept (Kanter, 1977) and the *Social Exclusion Theory*, we developed a theoretical model that helps us determine the reasons behind the low representation of female and disabled students in accounting higher education in the UK. In addition, the theoretical framework explains the changing relationship between higher education and the professional accounting world in relation to availability and differences of scarce resources (wages) during the financial crisis.

³ Women accountants make more ethical decisions than their male counterparts (e.g., Radtke, 2000). This can also be a reason explaining why more lower-paid women are recruited by employers during financial crises. However, please note that this is not our main focus in this study.

This study contributes to the existing literature related to gender inequality and the inclusion of disabled students in accounting higher education. The findings allow policy makers and academia to work together to solve one main reason behind the gender inequality in the accounting profession, which is mostly sourced from the inequality in accounting higher education. The research is intended to draw the wider community's attention to the importance of proper provisions for the disabled in accounting higher education, even during a crisis. Overall, our study offers a guideline to cause gender equality and inclusivity in the accounting profession. Most studies related to accounting education focus on one or a few universities and consider a small sample for a short time span to study gender inequality. Most of the time, the results are inconclusive, as they are the privileged perspectives of a narrow but dominant segment of society (Hammond et al., 2012). We overcome this problem by considering more detailed data of a large sample and by using a rigorous empirical model to test our research question. Thus, this study also contributes to the existing empirical literature in accounting through its advanced methodology.

The rest of the paper is structured as follows. In Section 2, we discuss the related literature and the hypotheses that we test in our study. Section 3 explains the methodology. Section 4 reports the results, and in Section 5, we conclude.

2. Theoretical Framework and Hypothesis Development

2.1 Theoretical background

Existing literature provides evidence of the importance of women's participation in the professional world and of the discrimination between women and men in the workplace

(Loft, 1992; Maupin and Lehman, 1994; Broadbent and Kirkham, 2008; Kmec and Gorman, 2010; Lehman, 2012). The corporate world and academia usually apply a discriminatory strategy (paying lower wages to women compared to men for the same work) to minimize labor costs and increase their profits (Hausmann et al., 2010; OECD, 2012). The wage gap has been prominent in the accounting profession for decades (Broadbent and Kirkham, 2008). One major factor responsible for the structured inequality in accounting is its male dominance (Hooks and Cheramy, 1988; Pillsbury et al., 1989; Ciancanelli et al., 1990; Lehman, 1992; Street et al., 1993; Spruill and Wootton, 1995; Fogarty, 1997; Lowe et al., 2001; Anderson-Gough et al., 2005). However, these studies fail to capture the gender inequality at the higher education level, which is to a great extent responsible for the gender inequality in practice. Statistics published by OECD (2012) show that as women approach higher levels in their professional career, they earn 21% less than their male counterparts. Therefore, is academic performance responsible for the gender inequality in the accounting profession? The answer is not really, but rather it is the lower wage rate that diverts student interest away from accounting in higher education.

However, a number of studies highlight the massive exclusion and marginalization of the disabled in any profession (Thornton and Lunt, 1977; Berthoud et al., 1993; Barnes et al., 1999; European Commission, 2001; Smith and Twomey, 2002; Grewal et al., 2003; Shaw, 2004). A similar picture is also observed in the accounting profession (Duff et al., 2007). As there are limited provisions for disabled students at higher education institutes, we find fewer disabled graduates. However, still, accounting professionals or academics in practice fail to employ disabled accounting graduates. The

wage gap between the disabled and the non-disabled is one of the major reasons for the non-inclusion of disabled accounting professionals (Duff and Ferguson, 2011). Therefore, disabled students find less interest in accounting programs in higher education.

Theoretically, how do we explain the above-mentioned issue? Let us consider Kanter's (1977) 'tokenism' and 'social exclusion' theories. According to Kanter, a token condition is a situation in which a socially distinct group (e.g., women and disabled persons in our study) constitutes only 15% or less of a corporation's membership, and the token individuals often lack power. This concept is widely used to explain the difficulties that women or any underrepresented group (in our study disabled students) face in any profession. Therefore, the tokenism concept can explain this social issue where men and people without disabilities dominate the accounting profession. By employing a larger number of women and disabled in an organization, tokenism can be controlled to some extent. However, the 'token' bears a cost in spite of their better performance in the organization, which usually affects the others in the same category. Some critics argue that such a gender-neutral theory cannot explain the gender inequality or non-inclusivity in dynamic corporations and ignores the complexity of gender integration in the workplace (e.g., Zimmer, 1988; Yoder, 1991; Turco, 2010). Thus, we introduce the social exclusion⁴ theory in addition to tokenism to strengthen the theoretical background of our study. One major cost associated with tokens is lower wages for the same work compared to counterparts and fewer career prospects (Silver, 1994). These costs allow tokens to feel socially excluded. This continuous social exclusion in the accounting profession is widely discussed in accounting literature (Loft, 1992; OECD, 2012). As social exclusion is a multidimensional process (e.g., education, health care, and legal assistance) we can see

⁴ For measurement of several aspects of social exclusion, see Levitas (2006: p135).

its impact on education. Following the theory, we argue that women and the disabled are less interested in accounting higher education because of the social exclusion of tokens (women and disabled) in the accounting profession. In fact, Daly (2005) argues that unless women or any underrepresented group (e.g., students with disabilities) reaches a critical mass, they have little impact on the culture of higher education. Although universities are encouraging women and disabled students to participate in higher education (with either a limited or wide capacity), the social exclusion explain their less participation in accounting higher education, and the culture of the universities remains the same.

Based on the social exclusion theory, Collins (1979) provides an insight about the changing relationship between education and occupational stratification. The study highlights the need to understand the above relationship on the basis of scarce resources (e.g., income and occupational status). During the recent global financial crisis, these scarce resources were affected in the UK as in other countries. Seguino (2010) reports that the financial crisis also affected the wage rates of accounting professionals, as critics raise questions concerning the ethical training of these professionals. The wage gap between men and women with similar job profiles is reduced during the crisis, first because of the lower average wage rates in the market and second because companies prefer to recruit only people (men or women) with specific expertise and higher academic performance.

Despite the fact that women perform better than men in higher education and obtain the same job as men at a lower wage, the proportion of women accounting professionals

remains low. Similarly, the wage rates of the disabled students are also badly affected, as companies find it hard to spend money for extra provisions for disabled persons.

Moreover, budget cuts at the university level restrict universities from providing enough support for the disabled and female students participating in higher education. Thus, theoretically it is important to test how the change in wage rates affects the number of women and disabled students in accounting higher education. Thus, the social exclusion theory allows us to understand this changing relationship between education and occupational stratification in the recent crisis period.

Hypotheses development

In the next section, we discuss the existing literature related to gender inequality and the exclusion of disabled students in accounting programs in higher education. From this literature review, we highlight the major gaps in the existing literature and later develop the related hypotheses to be tested.

2.2 Inequality in higher education of accounting

The accounting sector is mainly dominated by male professionals (Czarniawska, 2008; Kornberger et al., 2010). The available statistics indicate that in accounting firms (Czarniawska, 2008) and accounting teaching positions (HEIDI database), women are less visible than their male counterparts. Studies on gender and accounting argue that cultural and social barriers are the most common reasons behind the lower number of women in accounting (Kirkham and Loft, 2001; Johanson et al. 2008; Komori, 2008). Individuals need to acquire higher degrees in accounting provided mainly by higher

educational institutes to be employed as accounting professionals. Thus, there is a possibility that fewer female accounting students at the university level is to some extent responsible for lower female representation in the accounting profession. In existing studies, we find evidence of gender inequality in some aspects of higher education (Jacobs, 1996). Although the female-to-male student ratio has increased over decades in higher education, there exists a pronounced inequality in accounting higher education (Hausmann et al., 2010; Lehman 2012). We argue that the consistent wage gap in the accounting profession still adversely affects the interest of female students in accounting higher education.

The recent financial crisis has had a great impact on the world economy. Several firms in different industries in the UK and other countries are under scrutiny, mainly for their accountants' unethical behavior. Kohlberg's model of cognitive moral development (Kohlberg, 1969) is used extensively in research to explain the behavior of professionals (see Ponemon, 1990). This model can also be used to define the cognitive behavior of accounting professionals during the financial crisis. According to this model, professionals at the conventional level of moral reasoning adhere to rigid rules and conventions, which are seldom questioned. During a financial crisis, accounting professionals are at stage four of Kohlberg's model and are thus beyond the need of individual approval for their own activities. They follow the societal practices of others and maintain the social function determined by outside forces. Because of such mass moral degradation in the accounting profession coupled with the financial crisis, the male-dominated accounting profession is affected and male employees start losing their

jobs (Caliskan et al. 2014). Companies also drastically minimize the pay packages for their existing employees. From a social point of view, this badly affects families, which are dependent on the earnings of male family members. Consequently, female graduates start looking for jobs to support their families. Women are always interested in pursuing programs in higher education that guarantee a job in the future (Vaitilingam, 2010), even for lower wages compared to men (Hausmann et al. 2010). In the accounting profession, there is always a wage gap between men and women. During the financial crisis, the accounting academia experienced gender inequality (Poullaos, 2004). The changes in economy and social norms adversely affect the number of students participating in higher education (Crossick, 2010). Although the number of female accounting professionals has increased over the years (Ciancanelli et al., 1990), female students have developed a lack of interest in accounting higher education because of the above-mentioned wage gap. From this discussion, we see that the financial crisis immensely changes the environment of the accounting profession, which leads us to assume there is a change in gender inequality in accounting higher education. Based on the Spending Review Report (Russell International Excellence Group, 2013), the universities belonging to the Russell group consistently receive more public funding. Therefore, they intensively implement research-led teaching. Such activities at these universities attract more students, which also helps them to plough back their profits in times of need. Thus, during a financial crisis, these universities may maintain extra support for female students compared to other universities.

Based on the above discussion, we tested the following hypothesis:

Hypothesis 1: There is a positive growth of female accounting students during the financial crisis.

2.3 Non-inclusion of the disabled in higher education of accounting

Non-inclusivity of the disabled is always a big concern in the accounting discipline. Studies in accounting focus on either male dominance in accounting (e.g., Ciancanelli et al., 1990; Fogarty, 1997; Spruill and Wootton, 1995), color of accountancy (Annisette, 2003) factors that influence the ethical decision-making of accountants (Keller et al., 2007) or social class and accounting (Jacobs, 2003; Holvino, 2010). The learning experience of disabled accounting professionals is often overlooked in the related literature, even though disability rights legislation has been in place in the UK since 1944. This is a very important but overlooked limitation of the accounting literature. Interestingly, Duff and Ferguson (2007) find that companies in the UK have either no or minimal understanding of disability. In their study, they discuss many barriers that cause the small number of disabled professionals in accounting. One major reason is the wage difference among disabled and non-disabled accounting professionals. Based on this argument, we assume that the wage gap negatively affects the interest of disabled students in accounting higher education.

With the introduction of the Further and Higher Education Act (1992) in the UK, more adult participation from disadvantaged socio-economic backgrounds is expected (Bachan, 2013). More participation in higher education may lead to a scarcity of funding (Barr and Crawford, 1998), especially during a financial crisis. However, the higher education literature shows that debt constraints do not affect the choice of subject

(Callender and Jackson, 2008). Thus, we argue that less financial support cannot be responsible for the lower participation of disabled students in accounting higher education. In fact, it supports our previous argument that the wage gap is the main reason for the lower number of disabled accounting students. Moreover, liquidity constraints prevent firms from spending money to arrange support for disabled employees. The marginalizing behavior of employers toward the disabled is more prominent in times of financial crisis (Duff and Ferguson, 2011). This employer behavior is factored into the accounting professionals' ethical behavior, which altogether decreases the wage rates of the disabled and in turn affects the token's (disabled student) interest in accounting higher education. On the other side, budget cuts at universities restrict universities from providing sufficient support for different types of disabled students during a crisis period. However, as argued before, not all universities are affected by a financial crisis to the same extent. In fact, a number of universities use their scarce financial resources efficiently to support their disabled human capital. However, most of the studies on disabled student participation in higher education are based on survey data or a small sample, which is inconclusive. These findings based on a small sample, use HESA statistics, which are again dependent on the varying methodologies adopted by universities (Richardson and Wydell, 2003). We applied an advanced methodology consistent with similar literature on large samples to test the following hypothesis:

Hypothesis 2: There is a negative growth of accounting students with disability during the financial crisis.

3. Methodology

3.1 Sample and data description

Our initial sample consists of all 202 universities reported in the HEIDI database. We exclude universities with no information for any of the variables required for our model. The final sample includes 104 universities with information from the period 2005 to 2011. Following the finance literature, the period from 2008 onwards is defined as the crisis period in our model (e.g., Campello, 2011). To maintain a balance in the data, we consider the period three years before and three years after 2008. The difference between the number of female accounting students in the years 2011 and 2008 is the dependent variable in our first model. In the second model, we use a similar measure for another dependent variable for disabled students (both male and female). To determine the impact of the crisis, we divided the universities in two groups. In our final sample, there are 19 universities that belong to the Russell Group (the control group of universities believed to be unaffected or least affected during the financial crisis), and the remaining 85 universities are the treatment group in our difference-in-differences model.

From the existing documents, we find that universities in the Russell group have more research funding (Russell International Excellence Group, Spending Review Report 2013). Thus, they provide advanced research-based practical and professional teaching and establish a transfer link with the business and public sector. Such features and their timely courses put those universities a step ahead of others in the industry. They generate more income compared with others, which they use for better provisions for female and disabled students, especially during a crisis. Based on this well-known fact, we assume that there will be a smaller or ignorable effect of the crisis on the universities in the

Russell group. Thus, our main independent variable is ‘affected universities,’ which refers to those universities that are likely to be affected by the financial crisis.

In our models, we control for other variables (data from HEIDI) that can have an impact on the findings. For example, we control for the age of the students, the mode of study (number of undergraduate and part-time students), ethnic background (number of black students), domicile of the students (number of the UK, EU-excluding UK and non-EU students), and number of alums (i.e., graduates) working full- time or part-time after graduating in accounting. We include these control variables (covariates) by calculating the average of each factor each year from 2005 to 2011 and include these variables step-wise in our models.

3.2 Econometric approach

To analyze the data and test the above-mentioned hypotheses, we use two methods. First, we employ propensity score matching, and second, we use difference-in-differences methods.

3.2.1 Propensity score matching

To evaluate a policy, it is important to determine the effectiveness of the particular intervention. This study has many policy implications. The findings can allow policy makers to evaluate the existing policies related to gender inequality and inclusivity of disabled accounting students in the UK and their link with the accounting profession. It is not possible to perform analysis on experimental data where subjects are randomly assigned to the treatment and control groups. The main concern in our data is the

differences between the treated and non-treated groups in one dimension that has similarities as well as differences. Our sample universities have many similarities, so it is hard to balance similarity along each of the dimensions. To overcome this matching problem, we use a propensity score matching method that reduces the problem to a single dimension—the propensity score. Here, the score is the probability that a unit in the full sample receives the treatment, given a set of observed variables. The main advantage of this method is that individual units can be compared on the basis of their propensity score instead of being matched based on all values of the variables. Moreover, this method does not require a correctly specified functional form. Below we discuss our model.

Suppose we use the ordinary least square (OLS) regression method for the model below

$$Y = \beta_0 + \beta_1 X + \beta_2 Treat + \varepsilon \dots\dots (1)$$

Where, Y is the difference between the numbers of female students studying accounting in the years 2011 and 2008. X is the vector of independent variables, and $Treat$ is the treatment group, which equals 1 if the university is not in Russell group and 0 otherwise. In other words, the universities in the Russell group are in the control group, and all other universities are in the treatment group. In the above Equation (1), it is plausible to assume that the effect of treatment (financial crisis) is constant across all universities. However, in reality this may not be true. Using propensity score matching, we can avoid this assumption and consider that the financial crisis may affect universities to different extents. However, the counterfactual question is what would have occurred to the universities in the treatment group had these universities not been affected by the financial crisis? Because of the fundamental problem of causal inference, it is not only

difficult but impossible to observe the outcome of the same unit when treatment and control universities are exposed to the same financial crisis at the same time period. To understand these complicated features, we follow the methods described below.

Consider that the impact of the financial crisis on university i (denoted by Φ_i) is the difference between potential outcomes with and without financial crisis, so that the following condition is satisfied: $\Phi_i = Y_{1i} - Y_{0i}$, where 1 and 0 refer to with and without financial crisis, respectively.

Therefore, to determine the impact of financial crisis on the female and disabled accounting students admitted to universities in the UK, we calculate the average treatment effect on the treated observation (ATT) by using the following equation:

$$ATT = E(Y_1 - Y_0 | treat=1) \dots \dots \dots (2)$$

where $treat=1$ refers to the financial crisis. We can rewrite Equation (2) as

$$ATT = E(Y_1 | treat=1) - E(Y_0 | treat=1) \dots \dots \dots (3)$$

In Equation (3), $E(Y_0 | treat=1)$ refers to the average outcome of the treated universities had they not experienced the effects of the financial crisis. Clearly, we cannot observe this term, but we can observe a corresponding term for the untreated, and we can calculate the following:

$$ATT_{other} = E(Y_1 | treat=1) - E(Y_0 | treat=0) \dots \dots \dots (4)$$

Therefore, the difference between ATT and ATT_{other} can be expressed as

$ATT_{other} = ATT + Selection\ Bias$. The selection bias is the difference between the above-mentioned counterfactual for treated universities and the observed outcomes for untreated universities. The selection bias should be zero for the validity of ATT_{other} .

In this matching method, we have two important assumptions. These are $(Y_1, Y_0) \perp \text{treat} | X$, i.e., potential outcomes are independent of treatment status (after controlling for the X variables), and for each value of X , there exists a positive probability of being both treated and untreated, which is known as common support.

We used a probit model to estimate the propensity score. We employed four types of matching algorithms - nearest neighbor, radius, kernel, and stratified matching.

3.2.2 Difference-in-differences (diff-in-diff) methods:

To determine the impact of the financial crisis on the number of female and disabled accounting students in higher education in the UK, we use Equation (1).

Here, Y_i indicates the difference between the numbers of female accounting students in the years 2011 and 2008 and the difference between the numbers of disabled accounting students in the years 2011 and 2008. The *Treat* variable is a dummy variable equal to 1 for the treatment group and 0 otherwise. Note that as mentioned above, the treatment group is associated with universities not in the Russell group. In the control group, all the universities that belong to the Russell group are considered. X is the vector of independent or control variables explained in Section 3.1. ε is the usual error term. The β_0 and β_1 identify the causal effects of financial crisis on the trend of female accounting students and disabled students, i.e., the change in Y before and after the treatment for the treated with respect to controls.

4. Results

In this section, we provide a summary of the major variables used in our study and our empirical findings. The detailed summary statistics are depicted in Table 1.

Insert Table 1 about here

In Table 1, we report the summary statistics of the treatment group, control group, and the full sample. The full sample includes 104 universities in the UK. The treatment group consists of 85 universities, and the control group consists of 19 universities. Here, the variable Female-Difference is the difference in the number of female accounting students for the year 2011 and year 2008. The mean of the Female-Difference for the treatment group is -51.84, whereas it is -31.35 for the control group.

4.1 Empirical Findings

4.1.1a Propensity score matching

We first estimate a propensity score-matching model. We consider the treatment variable (a dummy whether the university received the treatment—in our case it is financial crisis), and all the independent variables are considered in the diff-in-diff model. We retrieve all propensity scores, which we will match in later steps. We only compare observations that have similar propensity scores in the same range.

The propensity score-matching model uses a probit model as shown below:

$$Pr(Y_R = 1|X) = f(\beta_0 + \beta_1 X) \dots \dots \dots (5)$$

where $f(\cdot)$ is a function such that $F: X \mapsto \{0,1\}$, $\forall X \in R$. The function $f(\cdot)$ determines the structure of the probit model.

In particular, the model can be written as:

$$Y_R = \beta_0 + \beta_1 \text{Undergrad} + \beta_2 \text{StudyMode} + \beta_3 \text{Age} + \beta_4 \text{Domicile} + \beta_5 \text{Ethnicity} + \beta_6 \text{Employment} + \varepsilon \dots\dots\dots(6)$$

where Y_R is the treatment variable that takes on a value of 1 if a university does not belong to the Russell group and 0 otherwise.

From the results (not reported), we find that students from the UK, non-EU countries, and full-time students are less likely to receive the treatment. Therefore, we correct these variables by winsorizing the outliers. We find that the region of common support (discussed in the methodology section) is between 0.11 and 1 (with mean 0.89 and standard deviation 0.23) when the dependent variable is the difference in female accounting students between 2011 and 2008. A similar result is also obtained for differences in disabled students between 2011 and 2008. For example, for the University of Exeter, we get the propensity score of 0.29, which means the likelihood that the University of Exeter will receive the treatment (shock of financial crisis) is 0.29. We also calculate the optimal blocks, where each block consists of similar characteristics of independent variables. In other words, these numbers indicate that the mean propensity score is not different for the treated and the control in each block. We find that the optimal number of blocks is 7 for models with both differences in female students and differences in disabled students between 2011 and 2008. This algorithm suggests that the balancing property is satisfied; in each of the blocks, we have not only similar propensity scores but also similar characteristics of the independent variables, which we are trying to match.

4.1.1b Matching of propensity scores by different methods

We used four types of matching: nearest neighbor, radius, kernel, and stratified.

Table 2 reports the average treatment on the treated effect (ATT). We take the number of treated observations and find the number of control observations that are the nearest neighbor. The difference between the outcomes of treated and control observations after matching is reported in Table 2.

Insert Table 2 about here

In the nearest neighbor method, the ATTs for female accounting students and disabled accounting students are 37.41 and -6.18, respectively. According to the radius matching method, we find that the ATT for female accounting students is 16.6, and the ATT for disabled accounting students is -3.99. The findings of the kernel and stratification methods are similar to the radius matching method; the respective ATTs for female accounting students are 17.98 and 15.78, respectively, and those for disabled accounting student are -6.17 and -6.44, respectively. The reported bootstrapped standard errors are obtained by 500 replications. The results indicate sufficient support for both hypotheses.

Insert Table 3 about here

4.1.2 Difference-in-differences models

In Table 3, we show the estimates of the model by diff-in-diff to determine the effect of the financial crisis on the trend of female accounting students in the UK. In Model 1, we estimate the two-sample t-test, where the differences between the means of the treatment group and the control group are shown. The adjusted R^2 in the first model is very small,

and the coefficient is not significantly different from zero. Therefore, in the other four models, we control for all the relevant variables related to domicile, ethnicity, and employment opportunity. The result shows that the number of female students in accounting is positively correlated with the affected universities and significant at the 1% level. The result implies that the number of female accounting students increased during the financial crisis, and this finding supports the first hypothesis of this study.

Insert Table 4 about here

In Table 4, we also estimate the models by diff-in-diff to determine the effect of the financial crisis on the number of disabled accounting students in the UK. In Model 1, we estimate the two-sample t test, and we find similar results, as discussed above. The result shows that in Model 2, Model 3, and Model 4, the number of disabled students in accounting is significantly and negatively associated with the affected universities. The result implies that the number of disabled accounting students decreased during the financial crisis, which supports the second hypothesis of this study.

4.2 Robustness Tests

We test the robustness of our findings with alternative model specifications.

First, we take the differences between the years 2011 and 2005 (please note that in our previous model, we take the difference between number of female or disabled students in the years 2011 and 2008) to check the validity of the findings. The results (not reported) remain qualitatively the same.

Second, along with the number of female accounting students, we consider the differences in the number of male accounting students and re-run the estimation. This comparative analysis also supports our previous findings for female students in accounting higher education.

5. Conclusion

Women and disabled persons are two important constituents of human capital. The existing literature notes a surprising behavior of our society towards them. A similar concern exists for accounting professionals (Loft, 1992; Duff et al., 2007, etc.). Studies show lower wages for women and the disabled compared to men and persons without disability in the accounting profession, respectively (Kirkham and Loft, 1993; Duff and Ferguson, 2011). Changes in social structure and many other factors have been identified for such differences. After careful investigation of the existing literature, which is mainly based on the oral history method (Kim, 2008), we use the differences in wage rates in the accounting profession to identify the differences in the numbers of men and women in the profession and use them as a proxy for gender inequality. Differential wage rates in accounting profession are also applied for the marginalization of disabled accounting professionals (Duff and Ferguson, 2011). As professionalization can be affected by changes in the economy, theoretically and empirically we show how the changes in wage rates in accounting profession for women and the disabled during the financial crisis affect the young generation's educational aspiration toward this profession.

As the accounting profession is dominated by men and professionals without disability, with the application of Kanter's tokenism, we highlight the prominent barriers for tokens (women and disabled). In line with the literature, we accept that the cost

associated with the tokens' better performance mostly keeps those tokens on the lower step of the career ladder. The impact of social exclusion is widespread. Thus, by complementing the tokenism theory with social exclusion theory, we argue that the token's interest in higher education could also change, especially when the associated cost is changed.

To become accounting professionals, most of them need to pursue university accounting degrees (Bryne and Flood, 2005). Therefore, we consider 104 universities in the UK for the years 2005–2011 to empirically test our research question. We argue that the wage gap in the accounting profession has reduced during the crisis. Massive 'job cuts' in the accounting profession for unethical behavior curtail male dominance, especially during the financial crisis. Existing studies report that female students prefer to undertake programs that give them more job opportunities, in spite of lower wages compared to male counterparts (OECD, 2010). Therefore, we expected that more female students would pursue accounting higher education than male students. Our empirical findings support this argument. This finding is also consistent with the report of the World Bank education database and the UNESCO world atlas (Accessed on 12 August 2013), which states that the number of female students has increased in higher education over the years.

The wages of disabled accounting professionals are always lower than those of the non-disabled (Duff and Ferguson, 2011). In addition, during a crisis, the scarcity of funds restricts employers from accommodating disabled graduates. This hinders disabled students from pursuing accounting degrees. Therefore, we find negative growth of disabled students in accounting higher education. We also consider the impact of a crisis

on a university budget with regards to supporting female and disabled students in accounting degree programs at a university. To our knowledge, this is the first study in accounting higher education related literature where this unique database is used to examine one of the important issues related to accounting and analyzed in detail by advanced econometrical tools.

The findings of this study contribute to the existing literature related to inequality and inclusion of the disabled in the accounting profession and establish a link with accounting higher education. This newly developed link between accounting higher education and its profession can assist policy makers in their future strategies. This study gives a clear indication that differential wage rates are the main source of gender inequality and the reason behind the non-inclusivity of the disabled in the accounting profession and in accounting higher education. The outcomes of this study suggest that, especially during financial crises, decision makers should consider the differential wage rates to regulate the spread of inequality and non-inclusivity in the accounting profession.

Similar to other studies, our paper has limitations. We consider the accounting students in general and do not make a distinction between domestic and foreign students. Because of lack of data availability, we cannot distinguish between the female and male disabled students. Moreover, we cannot find enough information about the precise number of accounting students entering university and the number of students becoming accounting professionals. Such detailed categorization will be considered in our future study.

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Table 1: Descriptive statistics

Variable	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max
	Full sample				Treatment Group				Control Group			
Female-Difference	-35.10	176.17	-1680	185	-51.84	89.96	-265	180	-31.35	190.38	-1680	185
Undergraduates	294.84	238.91	0	1224.29	252.44	134.59	0	502.14	304.31	256.14	0	1224.29
Part-time	77.75	155.58	0	1153.57	6.28	10.12	0	45.71	93.73	168.06	0	1153.57
Age (20-29 years)	188.19	152.63	0	755.71	179.02	114.07	0.71	465.71	190.24	160.48	0	755.71
Age (30 and more)	46.89	90.47	0	635.00	5.94	6.81	0	22.14	56.04	97.79	0	635
British Students	241.02	223.12	0	1152.86	166.65	108.17	0	355.71	257.64	238.76	1.43	1152.86
EU (excl. UK)	13.64	17.95	0	112.86	19.51	25.41	0	112.86	12.33	15.72	0	99.29
Non-EU students	58.95	61.16	0	322.86	98.57	79.72	0.71	322.86	50.09	52.83	0	257.86
Black students	92.36	132.45	0	697.86	42.29	39.70	0	146.43	103.55	143.10	0	697.86
Full time-leavers	16.79	13.39	0	61.43	20.08	15.95	0	61.43	16.05	12.74	0	57.86
Part time-leavers	3.01	3.37	0	17.86	1.47	1.69	0	5	3.35	3.56	0	17.86

Notes: Full sample includes 104 universities of the UK. The treatment group consists of 85 universities and the control group consists of 19 universities. The universities in treatment group refer to non-Russell group universities and the universities in control group belong to the Russell group. The data covers the year between 2005 and 2011.

Table 2: Propensity Score matching

Matching Methods	Number of Treated Observation	Number of Control Observation	ATT Female	ATT Disability
Nearest neighbor	85	6	37.41 (3.41)	-6.18 (-2.90)
Radius	19	10	16.6 (2.75)	-3.99 (-2.05)
Kernel	85	10	17.98 (2.49)	-6.17 (-2.17)
Stratification	9	86	15.78 (2.63)	-6.44 (-3.04)

Notes: ATT is the average treatment on the treated effect. Bootstrapped standard errors, shown in parentheses, are obtained by 500 replications.

Table 3: Effect of financial crisis on number of female accounting students

Dependent Variable	Female Students in Accounting				
	Model 1	Model 2	Model 3	Model 4	Model 5
Affected Universities	20.49 (-0.46)	105.40** (-3.18)	43.37*** (-2.22)	39.25* (-2.11)	49.39** (-3.38)
Undergraduate		-0.58* (-2.45)	-0.77* (-2.19)	-0.78* (-2.22)	-0.60 (-1.51)
Part time		-1.07*** (-3.67)	-1.60*** (-5.26)	-1.40*** (-4.09)	-1.81*** (-3.83)
Age >19 years & <30 years		1.33*** (-4.29)	2.59*** (-4.39)	2.14** (-3.10)	2.68*** (-3.53)
Age >29 years		0.48 (-0.96)	1.32* (-2.39)	0.94 (-1.51)	1.53* (-2.14)
Domicile					
UK			-0.34 (-0.64)	-0.18 (-0.34)	-0.49 (-0.71)
European Union (excl. UK)			0.26 (-0.22)	0.59 (-0.50)	0.08 (-0.06)
Non-European Union			-1.96** (-2.73)	-1.64* (-2.16)	-2.27** (-2.64)
Ethnicity					
Black				0.24 (-1.27)	0.27 (-1.26)
Employment Opportunity					
Full time					0.55 (-0.23)
Part time					-13.45 (-1.69)
Intercept	-51.84 (-1.28)	-140.00*** (-4.00)	-74.91* (-1.99)	-64.17 (-1.67)	-76.48 (-1.96)
Observation	104	104	104	104	104
Adj. R ²	-0.008	0.49	0.55	0.55	0.56

Notes: t-statistics in parentheses. * p<0.05, ** p<0.01, *** p<0.001.

Table 4: Effect of financial crisis on number of disabled accounting students

Dependent variable	Disabled Students in Accounting				
	Model 1	Model 2	Model 3	Model 4	Model 5
Affected University	-4.947 (-0.69)	-10.28* (-2.21)	-3.04* (-2.61)	-2.46** (-1.48)	-3.14 (-0.61)
Undergraduate		-0.08* (-2.33)	-0.10* (-2.05)	-0.11* (-2.08)	-0.11 (-1.77)
Part time		-0.18*** (-4.43)	-0.25*** (-5.57)	-0.22*** (-4.37)	-0.27*** (-3.88)
Age >19 years & <30 years		0.19*** (-4.23)	0.34*** (-3.96)	0.27** (-2.76)	0.32** (-2.91)
Age >29 years		0.05 (-0.76)	0.15 (-1.89)	0.10 (-1.08)	0.15 (-1.45)
Domicile					
UK			-0.04 (-0.49)	-0.016 (-0.20)	-0.02 (-0.13)
European Union (excl. UK)			-0.02 (-0.12)	0.03 (-0.15)	0.01 (-0.06)
Non-European Union			-0.22* (-2.14)	-0.17 (-1.62)	-0.22 (-1.73)
Ethnicity					
Black				0.03 (-1.23)	0.03 (-0.90)
Employment Opportunity					
Full time					-0.13 (-0.37)
Part time					-1.11 (-0.95)
Intercept	-1.05 (-0.16)	-13.72** (-2.79)	-6.13 (-1.13)	-4.63 (-0.84)	-5.56 (-0.98)
Observation	104	104	104	104	104
Adj. R ²	-0.005	0.608	0.638	0.64	0.637

Notes: t-statistics in parentheses. * p<0.05, ** p<0.01, *** p<0.001.